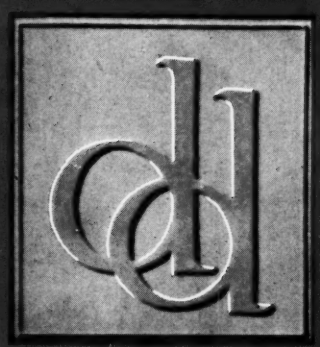
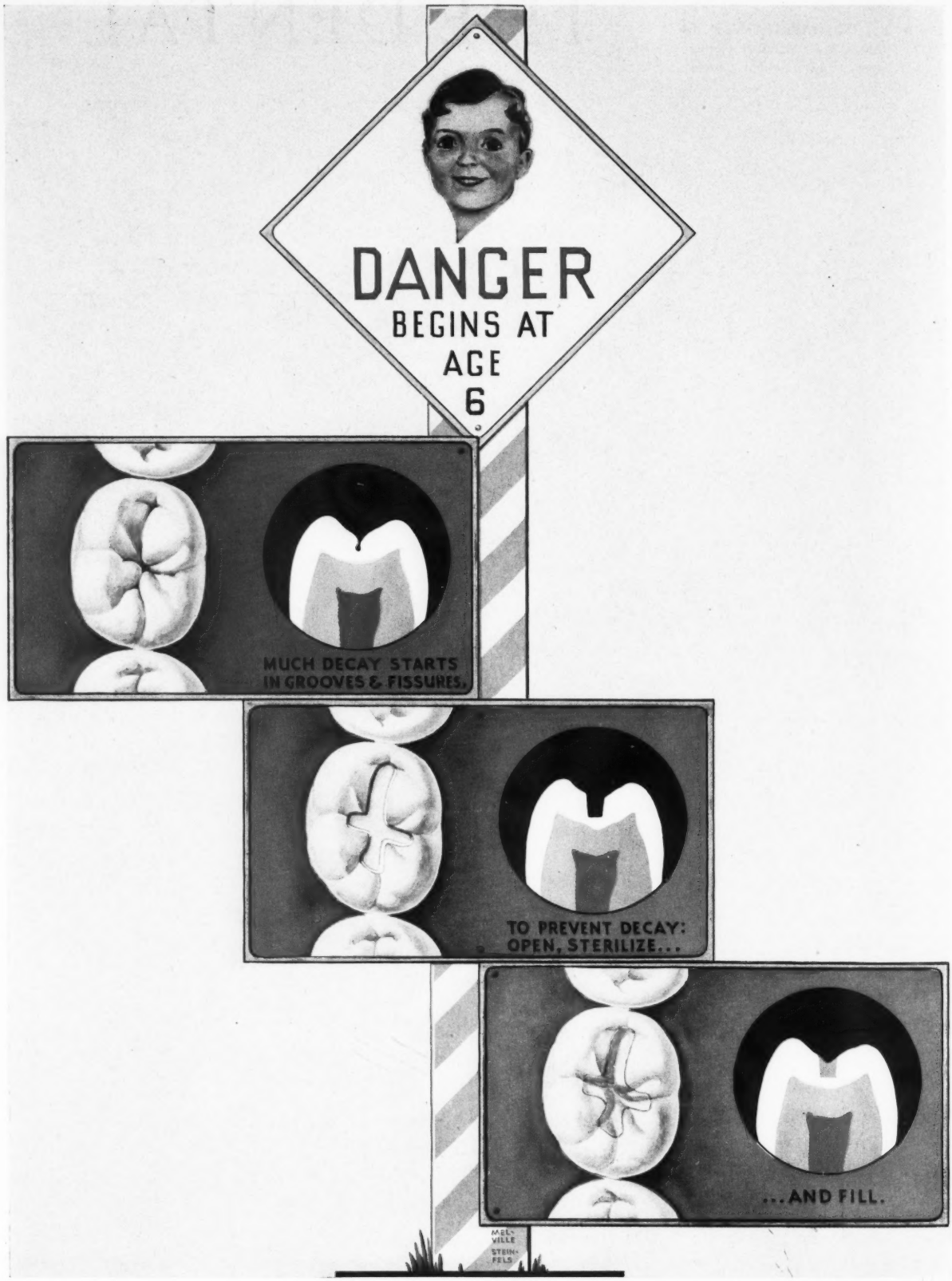
THE DENTAL DIGEST



DECEMBER, 1939

VISUAL EDUCATION IN DENTISTRY*

Danger Begins at Six



*This is the third chart in the fourth series of charts intended for the use of the dentist in explaining important dental conditions to his patients. The first three series have been published in bound form under the title VISUAL EDUCATION IN DENTISTRY.

About Our CONTRIBUTORS

LEONARD R. BRIGADIER received his D.D.S. in 1926 at the Baltimore College of Dental Surgery, Dental School, University of Maryland. Doctor Brigadier has previously contributed articles to the dental literature on matters of socio-economic interest, but as a general practitioner, he offers in THE DIGEST this month a practical article on operative dentistry: THE ANTERIOR ONE-HALF PIN-LAY.

•

W. LES WARBURTON, D.D.S. (Northwestern University Dental School, 1918) is a general practitioner with a special interest in prosthetics. He has previously written on the subject and has organized study clubs for that purpose. Doctor Warburton's article on ESTHETICS IN FULL DENTURE PLANNING was begun last month and is concluded in this issue.

•

W. WARD TRACY, D.D.S. is a graduate of Columbia University School of Dental and Oral Surgery (1935). Doctor Tracy has a general practice and he makes his first appearance as a dental author in these pages with an article for immediate clinical application: A RESTORATION FOR MAXILLARY INCISORS.

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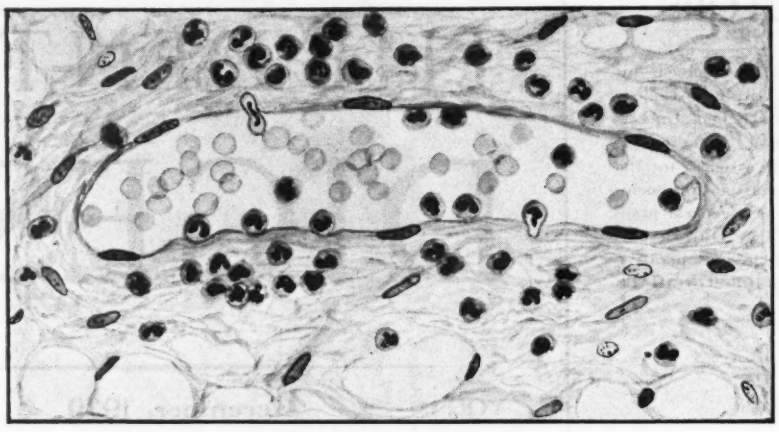
BARRIERS AGAINST SYSTEMIC INVASION FROM ORAL FOCI—NO. 2



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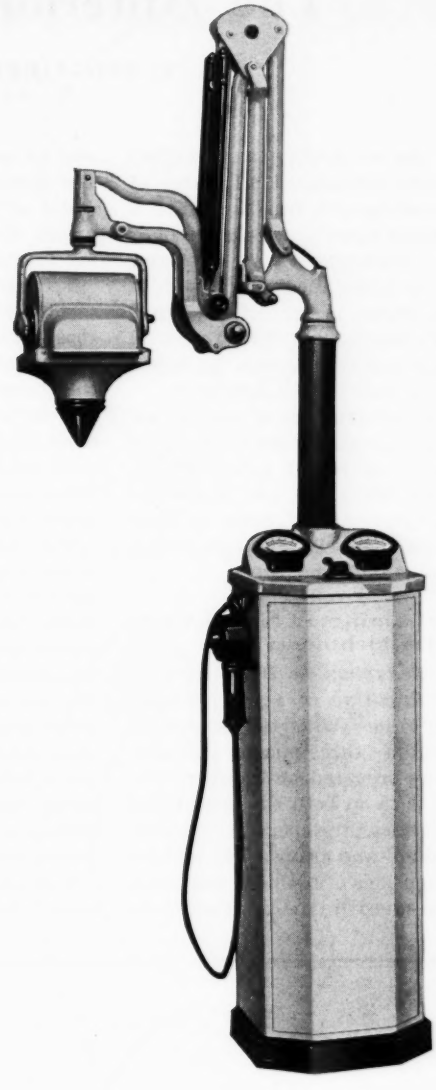

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The Anterior One-Half Pin-Lay

L. R. BRIGADIER, D.D.S., Jersey City, New Jersey

THERE ARE NO doubt many dentists who have condemned all forms of fixed restorations, but there are a great many cases in which the fixed bridge, particularly an anterior bridge, is unqualifiedly indicated. If such a bridge is properly designed and well constructed, it will meet all the requirements involved far better than any other type of appliance.

In the construction of simple cast gold attachments for the replacement of anterior teeth with a fixed bridge, obstacles, difficulties, and shortcomings are encountered. Some of these pitfalls are herewith analyzed with a view to their elimination.

Shortcomings in Simple Cast Gold Attachments

1. *A Reduction in Dimensions of Teeth, Resulting in Loss of Proper Esthetic Value*—When the usual types of anterior three-quarter attachments are prepared, obviously involving the slice on both the mesial and distal surfaces, the operator, at times, unavoidably and unfavorably reduces the dimensions of both the abutment teeth involved in the restoration as well as, perhaps, the adjacent teeth. The necessity for slicing through the distal surface on the cuspid, for example (Fig. 1), undeniably destroys the graceful contour of this surface.

2. *Injury to Teeth, Predisposing to Caries*—In the preparation of full three-quarter castings, no matter how careful the operator is, he may sometimes find that he has cut into the adjacent surface of the next tooth, and he may wonder how much time will elapse before the patient returns presenting caries in that adjacent tooth.

The incidence of this type of caries is not so great in the square types of teeth as it is in both the tapering and ovoid types, especially the short crown forms. Furthermore, the development of caries involving almost the entire dentine in an abutment tooth often occurs under a bridge that comes loose, and is frequently unnoticed by the patient. Too much stress because of single abutment bridges is often responsible for these destructive influences.

3. *Production of Low-Cost Attachment*—The necessity to produce an economical, low-cost attachment is likewise an important difficulty. There are several beautiful and highly satisfactory types of attachments that are used for anterior restorations employing the use of baked or fused porcelain, but the laboratory cost of production often precludes the possibility of this choice.

Description of Anterior One-Half Pin-Lay

The anterior one-half pin-lay, briefly, consists of a thin veneer casting in hard gold embracing only two surfaces of the tooth to be used as an abutment; that is, the lingual surface and either the mesial or distal surface as the indication may be. It contains a lock groove, similar to that of full three-quarter castings and two accessory anchorage iridioplatinum pins which establish sure retention. The construction of this attachment is simple, and despite appearances is not at all time-consuming. After several practice preparations (which I would suggest doing at first on practice models outside the mouth) the operator will certainly gain the nec-

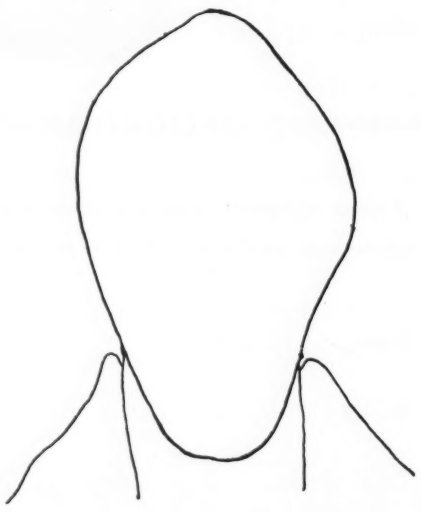

Fig. 1—Labial surface of cuspid. Graceful contour of distal surface usually destroyed by slice.

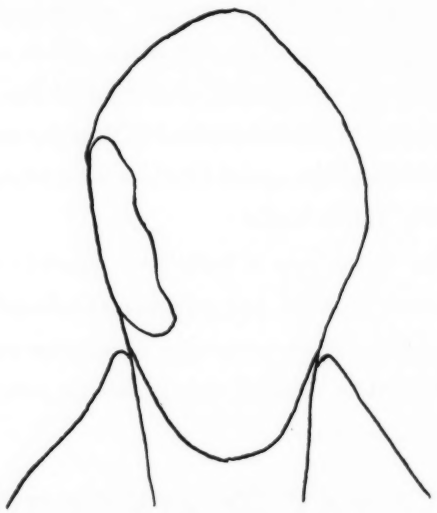

Fig. 2—Proximal slice; lingual view.

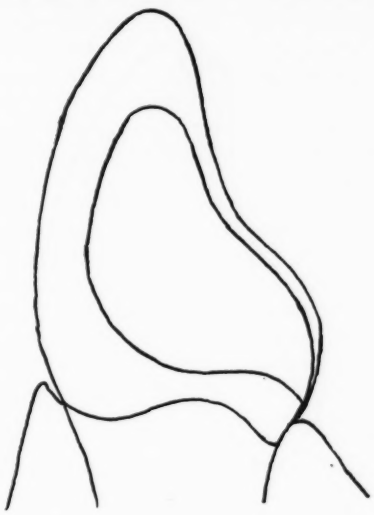

Fig. 3—Proximal slice; proximal view of operative surface.

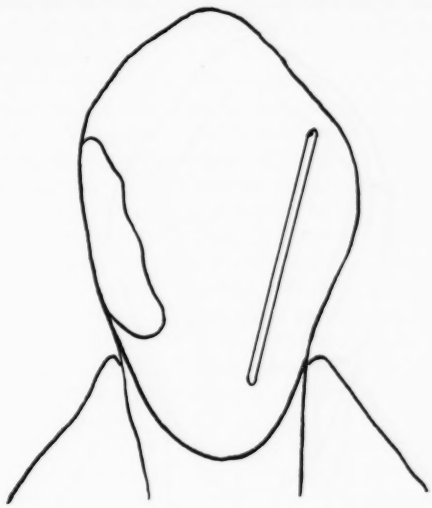

Fig. 4—Knife-cut; lingual view.

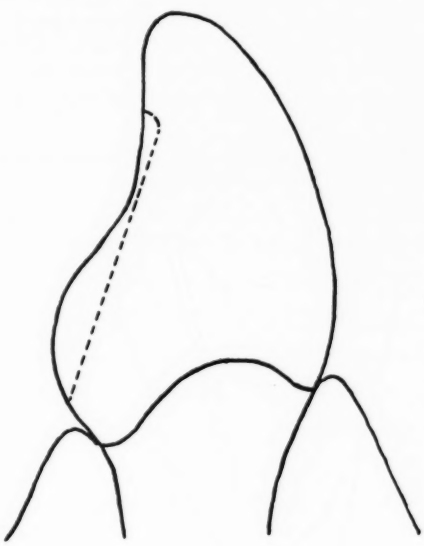

Fig. 5—Knife-cut; proximal view of non-operative surface showing depth of cut.

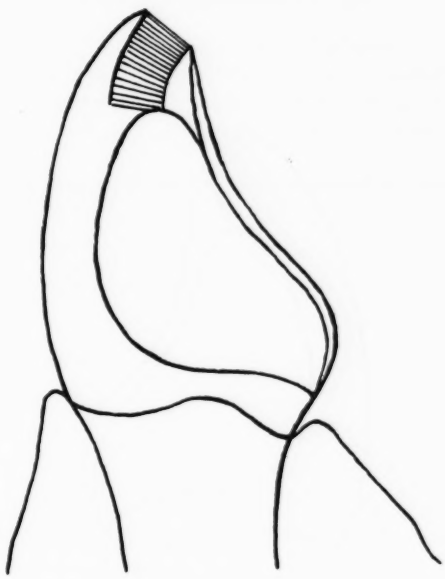

Fig. 6—Incisal bevel; proximal view of operative surfaces.

essary confidence to help him complete his task.

It is absolutely essential to have all the necessary armamentarium employed in excellent condition; new burs, true-cutting stones as well as a true-running handpiece and contra-angle. Carborundum disks, mandrels, and stones should be carefully examined before used, because the degree of success depends in a large measure on their true-running performance.

General Considerations

1. Anterior one-half pin-lay abutments are indicated only on all anterior non-carious teeth.

2. Double abutments of this type are usually made even to replace a single tooth. Occasionally, single abutments may be used to replace one pontic, employing an auxiliary finger-rest under which a gold filling is seated. The ideal indication is, of course, to employ double abutments when two or more pontics are to be replaced.

3. Special locking-in devices are sometimes resorted to when bridges are too long a span, or if the abutment teeth deviate from their normal positions in a severe irregular manner.

Fig. 7—Incisal bevel; lingual view.

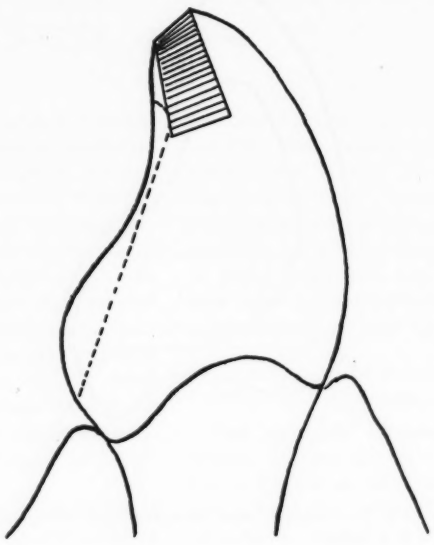

Fig. 8—Incisal bevel; proximal view of non-operative surface showing extent of bevel.

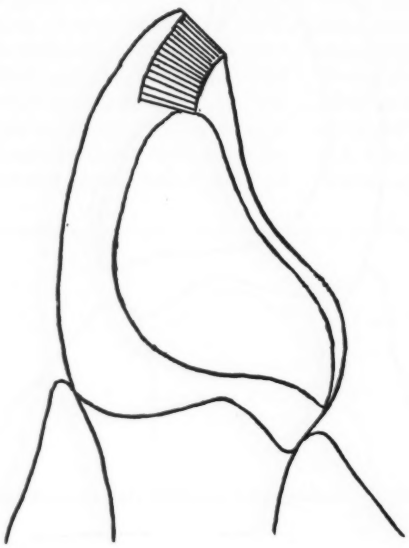

Fig. 9—Lingual reduction; proximal view of operative surface.

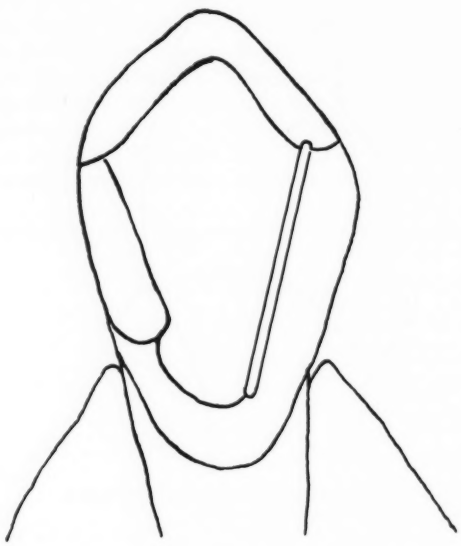

Fig. 10—Lingual reduction; lingual view.

4. The technique here presented is typical, slight alterations being made according to the different types of teeth and the relationship of their respective pulps.

Technique for Preparation

The preparatory technique is divided into six separate parts, for the sake of brevity and clarity: (1) the proximal slice (Figs. 2 and 3); (2) the knife-cut (Figs. 4 and 5); (3) the incisal bevel (Figs. 6, 7, and 8); (4) the lingual reduction (Figs. 9, 10, and 11); (5) the lock groove (Figs. 12 and 13), and (6) the accessory anchorage pits shown in Figs. 14, 15, and 16.

1. *The Proximal Slice*—The proximal slice (Figs. 2 and 3) is produced with a seven-eighths safe-side carborundum disk, the straight handpiece being held parallel to the incisal edges of all the anterior teeth. The disk is also brought in at an angle

of 30 degrees toward the lingual and must not be allowed to come in contact with the labial surface. It is important to maintain the parallelism of the preparation. This is simple, for, once the cutting position of the disk has been set, it will be observed that the operator's arm is in a straight line from the elbow down to the fingers. To keep this line straight the wrist must not be bent but the elbow should be allowed to become the fulcrum in this movement.

2. *The Knife-Cut* — The knife-cut (Fig. 4) is made in the base of the marginal ridge and runs the entire length of this fossa. The cut is started, to be sure, in the deepest part of this depression and extends to the gingival but not quite to the incisal edge. This can be done with a knife stone, number 39 Crystalon (contra-angle). I prefer, however, to use the straight handpiece with a knife stone, number C4407 made by The Carborundum Company. The patient reclines with the head tipped backward. The depth of this cut at its deepest point does not exceed 1 mm. (Fig. 5).

3. *The Incisal Bevel*—The incisal bevel (Figs. 6, 7, and 8) is produced at an angle of 45 degrees with a number 4 Crystalon stone.

4. *The Lingual Reduction*—The lingual reduction (Figs. 9, 10, and 11) is produced with a number 4 Crystalon stone or S. S. White, number 11 stone. This reduction is effected along the lingual surface only as far as the knife-cut. The occlusion is checked at this point so that clearance in functional occlusion can be obtained with three thicknesses of tissue paper. The operator should not cut any more of the lingual cingulum than is absolutely necessary to clear the occlusion. Sandpaper disks are used to smooth the entire lingual surface, also rounding the angle created by the proximal slice at the gingival.

5. *The Lock Groove* — The lock groove (Figs. 12 and 13) is made parallel at all times to the incisal two thirds of the labial surface of the tooth. A cross-cut fissure bur, number 800L is used first and is followed by a 700 or 700L cross-cut fissure bur (contra-angle). It is started at the angle created by the union of the incisal bevel and the lingual reduction (Fig. 12). This will yield the longest groove that is safely possible and, of course, means greater retention. Parallel inclinations to the labial incisal two-thirds will vary, naturally, with the different types of teeth.

6. *The Accessory Anchorage Pits*—The accessory anchorage pits (Figs. 14, 15, and 16) are made with a number ½ round bur (contra-angle) to a depth of 1.5 mm. These holes run parallel to the lock groove, and the two pits are cut at the same time; that is, after the initial cuts are made to start the holes in their respective positions, the handpiece is allowed to rest for a moment in the lock groove in order to obtain a check on the parallel position, and then, without bending the wrist, moving the bur to the position of the pits. These are then cut slowly, alternately proceeding from one to the other, and then checking the parallelism of the handpiece again with the lock groove. This cycle is repeated until the desired depth (1.5 mm.) is obtained in each pit (Fig. 16).

Waxing Technique

I prefer to use the direct, melted wax technique in the production of the pattern. With the patient in the

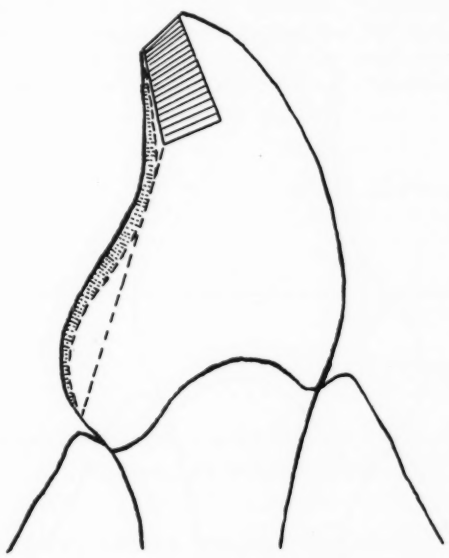

Fig. 11 (Above)—Lingual reduction; proximal view of non-operative surface.

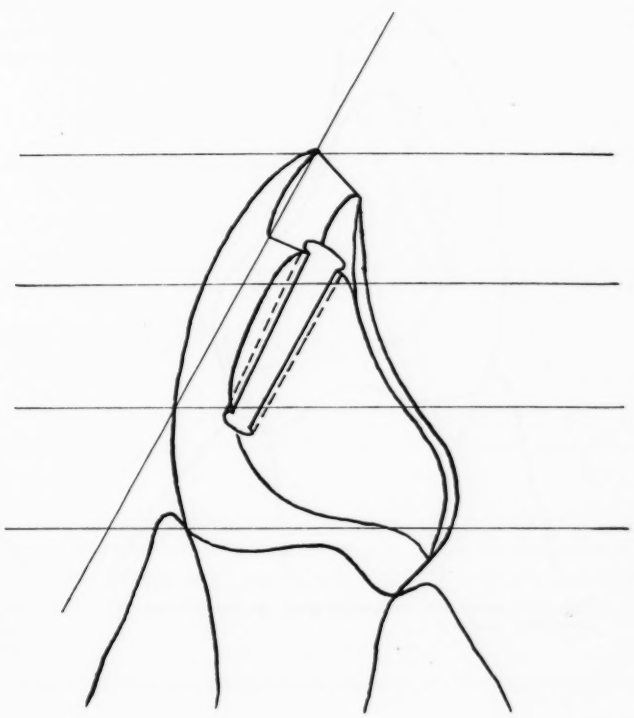

Fig. 12 (Right)—Lock groove; proximal view, showing parallelism with incisal two-thirds.

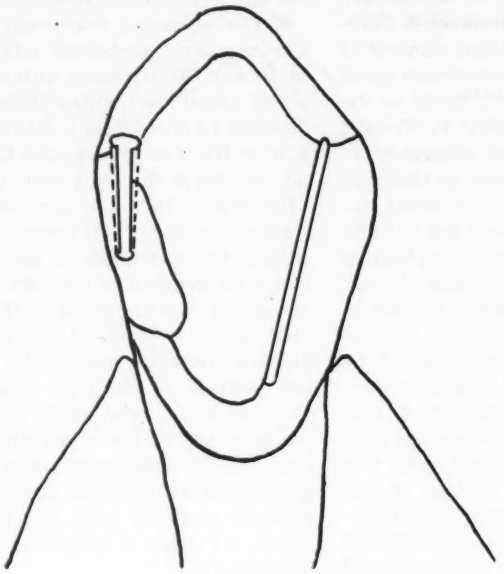

Fig. 13—Lock groove; lingual view.

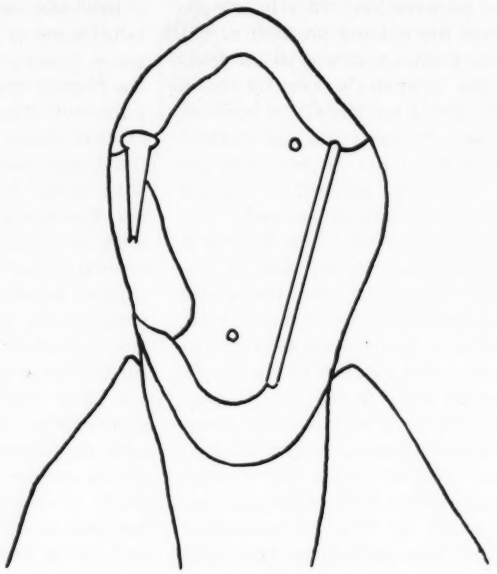

Fig. 14—Accessory anchorage pits; lingual view.

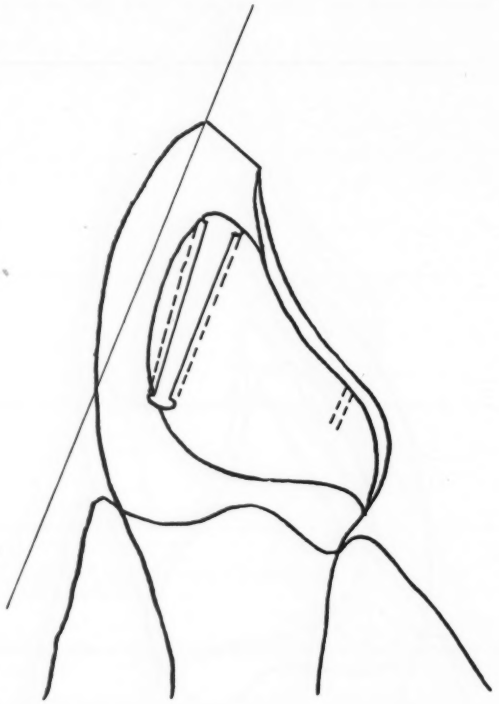

Fig. 15—Accessory anchorage pits; proximal view of operative surface.

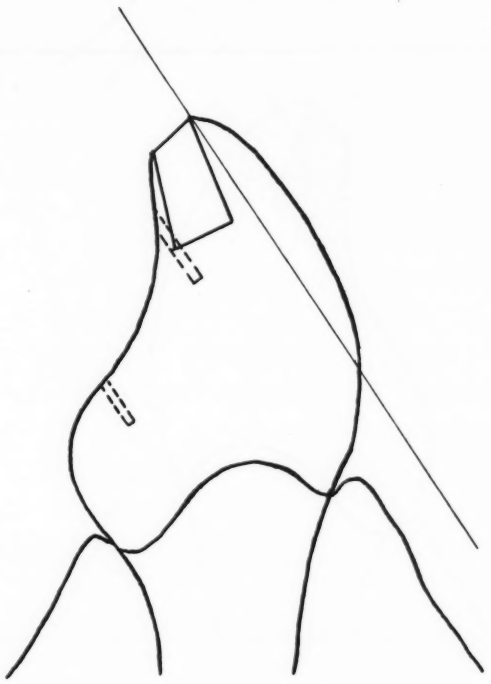

Fig. 16—Accessory anchorage pits; proximal view of non-operative surface showing depth and position of pits.

reclining position and the head well back, the wax is melted on the tooth and spread over its surfaces in a thin coating. Kerr's regular inlay wax is used and a hot pointed instrument is inserted along the lock groove. With the wax still warm, a little finger pressure is used to adapt the wax closely to the tooth. The patient's saliva is used as a lubricant before the melted wax is applied. The pattern is now trimmed and the undercuts are freed of wax. Little carving is necessary because there is no great bulk to be trimmed. The pattern is now carefully removed, inspected, and returned to the tooth, the margins being readapted.

Insertion of Pins

For the insertion of pins 24 gauge iridioplatinum pin wire is used. It corresponds perfectly to a hole that is made without any vibration by a ½ round bur. Two pieces of wire are cut, each measuring about one-fourth inch long. At the end of each pin the edge is bent in at right angles at a distance of approximately one sixteenth of an inch in from its end. This bent end is grasped with cotton pliers and is heated slightly and carried into the wax pattern. This right angle bend affords the retention necessary in the investment material. After the remaining pin is treated in like manner, the bent pins are touched with a hot instrument so as to cause the melted wax immediately about them to flow carefully around, even into the holes if they will. This assures a complete filling-in of wax about the pins, holding them firmly in the pattern.

Removal of Pattern

The pattern is removed carefully, two instruments being used at the same time and at different points of the pattern so that it will not become distorted.

Investment and Casting

The Cristobalite investment technique is used, with a mix that varies between 10 and 15 degrees above room temperature. This assures a close fitting casting that goes to position under finger pressure. It should never become necessary to employ the use of an automatic plugger to seat any casting. This act is not only fraught with danger of fracture of the tooth but also indicates an over-expansion of the metal.

A good hard gold is used for the casting, usually an 18K, 4 per cent platinum combination. This will yield margins that are hard, yet burnishable. When the wax is sufficiently eliminated, the casting is made with the ring red hot and as quickly as possible, so as not to lose any heat, for the pins within the investment will weld perfectly to the casting gold, provided the ring is kept hot.

After casting, the investment ring is allowed to cool in the usual manner and the casting is removed and cleaned in concentrated hydrochloric acid.

Summary

The technique here presented for the anterior one-half pin-lay presents the following advantages:

1. Maximum esthetic efficiency is obtained because there is no slicing through of that "third surface" and therefore no consequent loss of mesiodistal diameter. The finished abutment presents no gold visible from the labial.

2. Full mechanical efficiency is present. These attachments are strong and seem to possess the necessary retentive factors required.

3. The possibility of interproximal caries occurring adjacent to bridge abutments of this type is prevented because of the elimination of the interproximal slice.

4. The preparation is a comparatively easy one to make, involving less cutting of good tooth structure than most preparations. This makes it easier on the patient and less time-consuming for the operator.

5. The anterior one-half pin-lay can be produced at low cost.

193 *Newark Avenue.*

Announcement of Books Received

HEALTH FOR HIGH SCHOOL PUPILS: A Public Health Study of the Adolescent in a New York City High School of 6000 Pupils, By William Schmidt, M.D., Director of Study, New York, Progressive Education Association, 1939.

DENTAL CARIES: Findings and Conclusions on Its Causes and Control, Compiled for The Research Commission of The American Dental Association and presented in 189 pages, by The Advisory Committee on Research in Dental Caries, New York, 1939. (Cloth bound: $1.00 per copy for members of the American Dental Association. Regular price: $2.00. Address: Doctor Daniel F. Lynch, 2651 Sixteenth Street, N. W., Washington, D. C.

THE MERCK INDEX: An Encyclopedia for the Chemist, Pharmacist, Physician, Dentist, and Veterinarian, Fifth Edition, Rahway, New Jersey, Merck & Co., Inc., 1940.

Esthetics in Full Denture Planning*

W. L. WARBURTON, D.D.S., Salt Lake City

CONCLUSION

Utilization of Preextraction Records

To develop an ability to reproduce esthetic dentures a complete set of preextraction records is essential. The making of complete preextraction records should be a part of every dental practice. The operator who does not make use of these records handicaps himself and fails to present the service the patient deserves. The importance of preextraction records cannot be stressed too much. Surely the operator who removes the remaining teeth should instruct the patient as to the advantages gained by having such records.

Complete preextraction records should include photographs, masks, profile templates, measurements, impressions, color and form selection, and charting of any defects that might aid in the reproduction of individual characteristics.

Photographs—Photographs[3] should include three views: (1) direct front with the teeth in gentle occlusion and lips closed; (2) direct front with the teeth closed as in a broad smile showing both teeth and gums; and (3) the profile view. These prints should not in any way be retouched by the photographer. If the operator wishes, this photography can be done in his own office.

Face Masks—Photographs are indispensable records and are easily filed for future use; however, I believe, the mask[4] to be more helpful from a third dimensional consideration. Not many operators have resorted to the plaster of Paris method of mask-making, but with the new hydrocolloids, techniques have been developed that afford excellent results with little effort. The making of masks with the hydrocolloids is a pleasant procedure. Hydrocolloids are known for their lack of adhesive qualities; therefore, no oiling or greasing of the hair, whiskers, lashes, or skin is necessary. The only precaution necessary is that on tender skins the temperature of the material be lower than is necessary on less sensitive skins.

Profile Templates — Profile templates are made by cutting cardboard to fit the face in the median line. These templates are indispensable and can be made from the photograph the exact size record, or by the roentgenographic, wire, wax, or plaster method. The profile record should be complete from the forehead to the base of the chin and not from the tip of the nose to the symphysis of the chin as is so frequently seen. It should be cut out in detail and checked back to the face to make all necessary corrections. Markings on the profile template can show the incisal edge line of both upper and lower central incisors. These profile records are invaluable for a future checking of the vertical dimension or collapse of the lips at the median line.

Measurements—Measurements can be made and recorded of distances between landmarks, such as from the corner of the eye to the corner of the mouth; from the ala of the nose to the base of the chin; from the incisal edge of the lower teeth to the base of the chin. For these measurements, several instruments are on the market.

Impressions — Impressions should be made of both upper and lower teeth, from which study or record models can be poured. These impressions should be of the full dentition and complete as to detail. I have always used the sectional compound method for this work and prefer it to the new hydrocolloid method; however, some operators are having fine results with the hydrocolloids and their use is to be commended when compared to the old snap wax or compound impression method.

The extracted teeth can be inserted in the sectional or the colloid impressions and the model poured with the teeth in natural position; or the original impression can be poured in plaster and later a duplicate impression made from this for the insertion of the extracted teeth.

Because extracted teeth have to be kept moist in order to preserve their color, the model is made in plaster and the teeth preserved until such time as the case is under construction.

If the case is of the immediate denture type of construction, a study model should be made of the original model by the duplicating process. Too many immediate denture advocates have been using only one model, and, on the removal of the plaster teeth in making the set-up lose the replica of the natural teeth.

Another invaluable impression is made by molding compound over the labial surfaces of the anterior teeth and first bicuspids with the teeth in centric occlusion. This impression is taken in two sections, right and left, making it possible to get a detailed impression of the first bicuspid area. Models made from these impressions serve as a definite aid in developing inclination, overbite and overjet of the anterior teeth, but can be eliminated from the preextraction records if proper study models are made and mounted on an occluding frame. In addition to their use as preextraction records, however, anterior block models when arranged according to type, age, and sex serve as convenient guides for developing a knowledge of tooth form and arrangement. For such purposes I have taken these impressions for years, not only of prospective denture cases, but also of others.

Color Selection Recording—A great deal has been written on the color of the teeth, and the difficulty of matching present shade guides to the natural teeth is well known. In reproduction or imitative art, we deal only with the lightest shade or hue of the tooth and develop the intensity of saturation and darker areas with stains. In recording the color, therefore, the lightest shade is selected, whether it is the gingival, middle, or incisal portion of the tooth.

The selection of tooth form in preextraction cases can be made from the mouth, or later, with the study model and extracted teeth as a guide

Charting—To complete the preextraction records a detailed charting of all the individual characteristics of each tooth is made.

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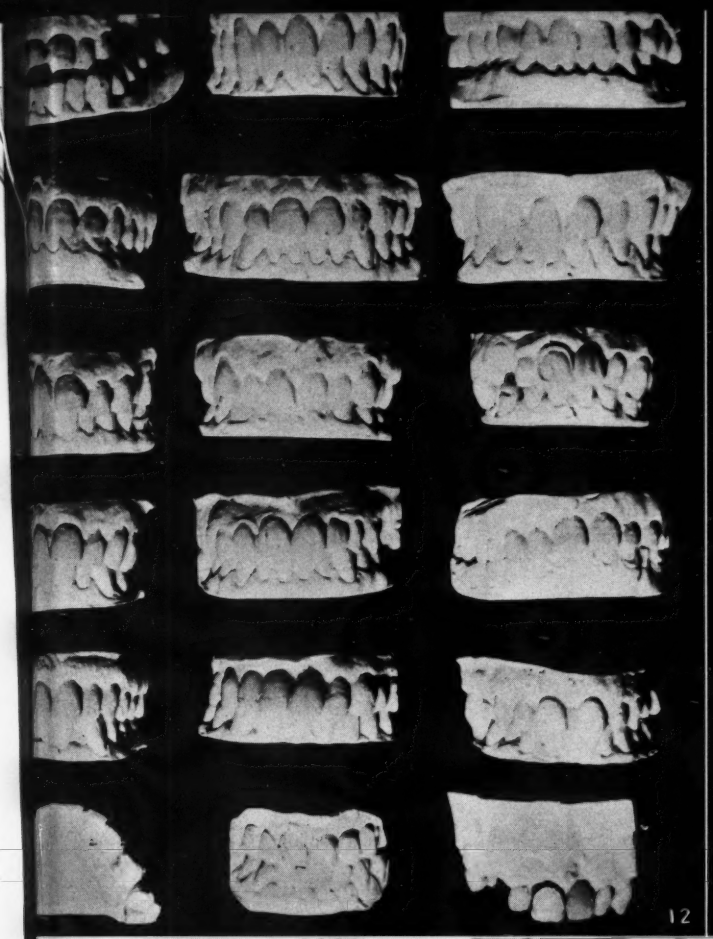
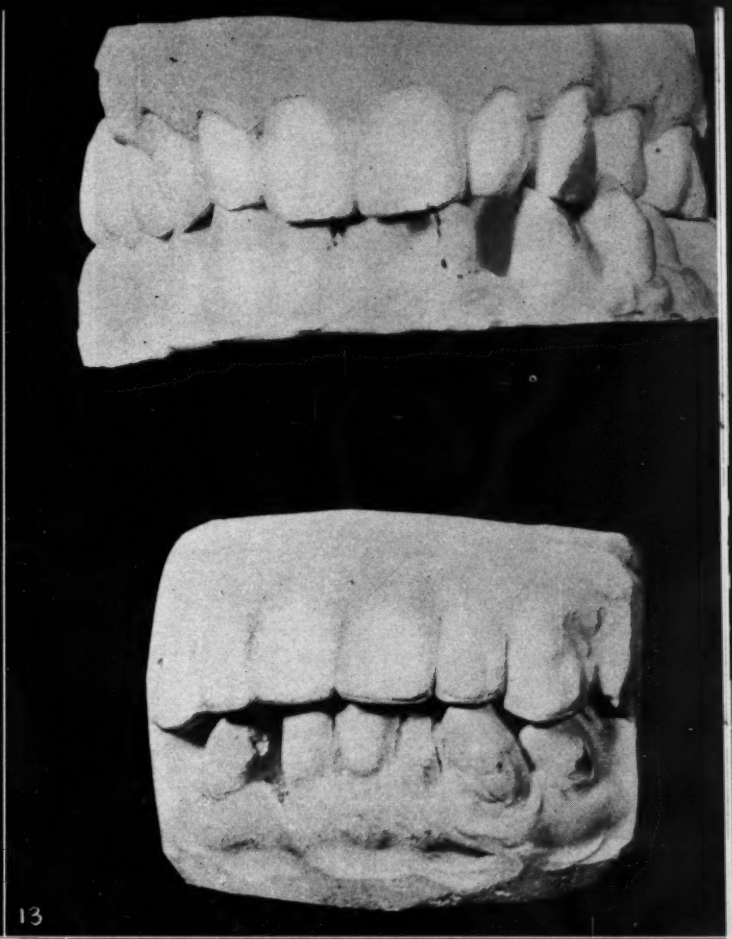
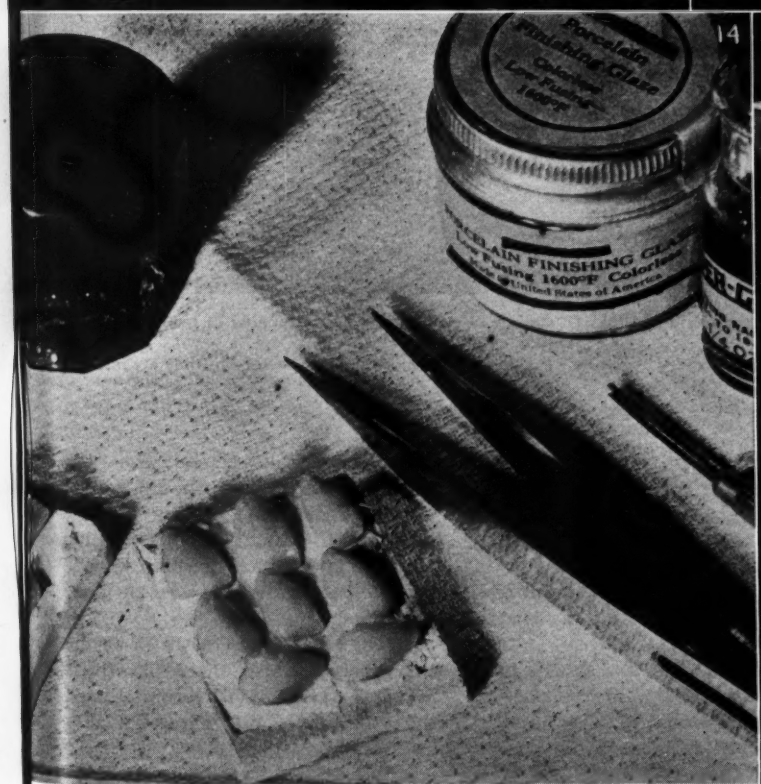
*Read before the National Society of Denture Prosthetists, Milwaukee, July 13, 1939.

[3]Bruening, E. H.: Photography and Its Uses in Prosthesis, J. A. D. A. 15:1225 (July) 1928.
[4]Himoff, I. T.: Moulage of the Face, DENTAL DIGEST 45:330 (September) 1939.







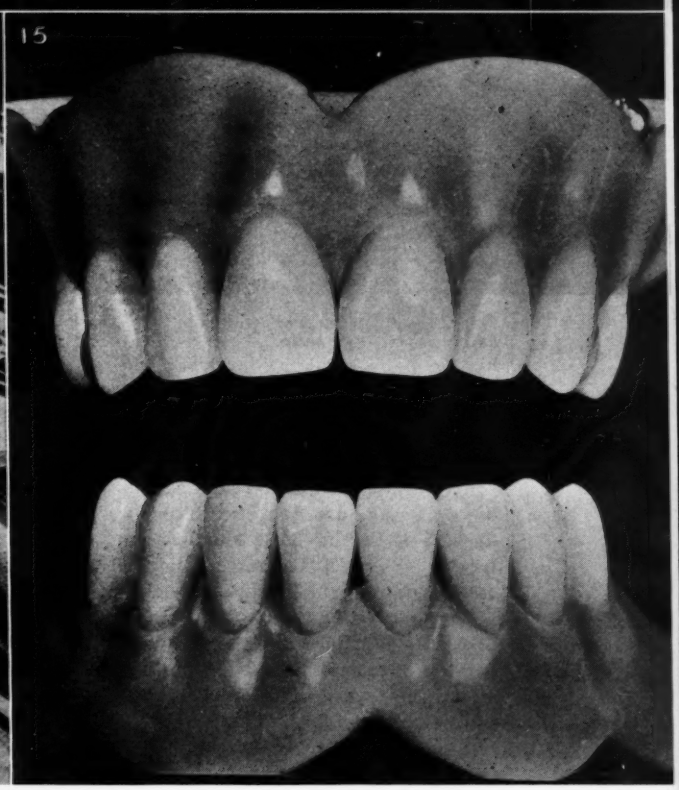


Fig. 12—Group of two-section impression anterior block models. Bottom row, center: one-section impression model for comparison; left, model made from sectional impression; a hydrocolloid can be used; right, model from teeth inserted into sectional impression.

Fig. 13—Upper, made from two-section impression; lower, made from one-section impression.

Fig. 14—Group showing: pin teeth immersed in tray of extra-fine silex; dappen dish of mixed glaze with cover; K-pliers, notched on inside of points to hold pin teeth; holder for interchangeable bridge type facings.

Fig. 15—Stereotyped set-up.

Fig. 16—Set-up showing recontoured, stained and reglazed, naturally-arranged teeth.

Fig. 17—Upper set-up showing bridge replacing right central and lateral incisors.

Figs. 18 and 19—Recontouring and arranging of teeth for individual characteristics.

Fig. 20—Inlays and gold foils may be extreme but they are natural!

Wax Set-Up

After having made a waxed set-up by esthetically arranging teeth of the desired form and basic shade, and, having approved the set-up in the mouth, staining and glazing are done.

Staining and Glazing—No branch of dentistry calls for a more highly developed artistic sense than the art of staining[5] porcelain. Porcelain restorations cannot be made successfully and completely unless staining and glazing are employed to some extent. Mineral staining, although an art complete in itself, should be practiced by all denture specialists and general practitioners regardless of their ceramic endeavors. With a little experience and understanding of the underlying principles, one may develop this staining technique to a satisfactory degree.

Preparation of Teeth—1. The teeth are removed one by one from the wax set-up, the operator making sure that the indentation of each tooth is retained in the wax.

2. The teeth are boiled in Gold Dust solution, scrubbed with soap and a stiff bristle brush, and finally bathed in chloroform, to remove all foreign matter. To make certain that the teeth are clean, they should be examined under a magnifying glass.

3. Pits, if present, should be filled by rubbing dry glaze powder over the surface before the first coat of glaze is applied.

4. The porcelain teeth of some manufacturers are denser than those of others, and it is recommended that the teeth of greatest density be selected.

5. Before any staining is done, all ground surfaces should have one coat of glaze to close the pores. If the porcelain is dense, stains can be applied over the unfired glaze while it is still

[5]Hardy, I. R.: Mineral Stains in Construction of Dentures, DENTAL DIGEST, 39:410 (November) 1933.

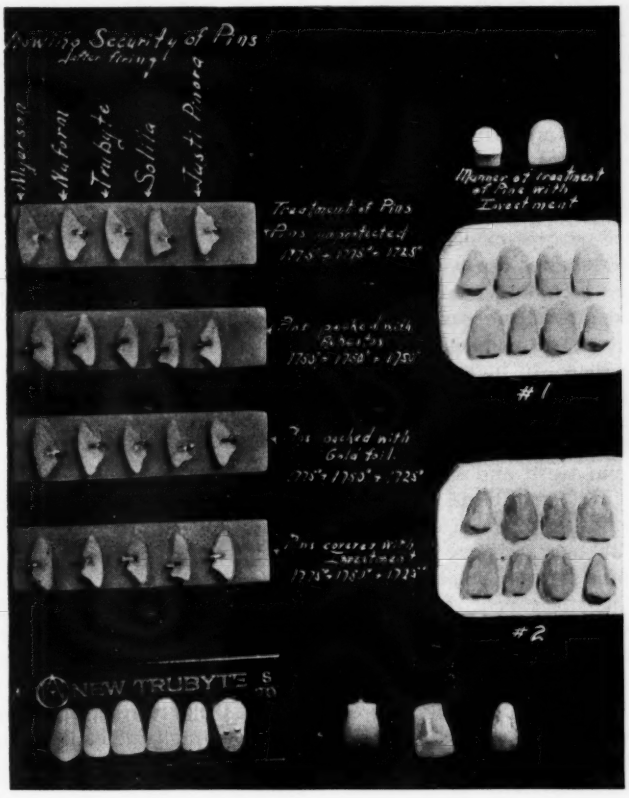


Fig. 21—Left: Security of pins after firing, different treatment of pins. All fired three times. Right: Investment of pin teeth in high-heat investment for security of pins—single and in groups: 1, before firing; 2, after firing.

in the moist state, but if the porcelain is pitted the first coat of glaze should be fired before staining.

Color Mixture—The general rules that cover all combinations of colors as exemplified in oil and water colors apply to the mixture of porcelain stains.

1. Mixed very thin, the stains produce a mere tinge of color.

2. Increasing the proportion of powder intensifies the saturation of color accordingly.

3. The stains can be used individually or mixed in combinations to produce secondary colors and variations lighter or darker.

4. If the tone of the tooth is yellow, the addition of brown will at first darken the yellow; then, as more and more is added, the tooth will be changed to brown. If the tone of the tooth is blue or grey, brown will at first merely deepen the blue or grey, but, on the addition of considerable brown, the tooth will become a decided brown. It is easier to darken a color than it is to lighten it.

5. When making a mix of any of the colors I find that the addition of pink develops a color that is more life-like in appearance after firing.

Manipulation of Stain and Glaze Powders—Mineral stain powders are supplied in several types as to temperature, the lowest at 1500 degrees and the highest at 2450 degrees. I have found no satisfaction in using the 1500 or 1600 degree stains as supplied on the market. The 1762 to 1900 degree stains in Steele's and the 1900 degree S. S. White stains have served my purposes well. A preference is made for the black and brown in the S. S. White stains; otherwise the stains are of similar quality. For opaque white, I recommend chemically pure tin oxide, which, being a flat white should be mixed with a small amount of glaze powder before it is applied to the tooth. The opaque white of the prepared stains is to be used for blending colors and does not produce white striations or decalcified spots as well as tin oxide. For high-fusing porcelain, Justi 2450 degree stains are the most satisfactory.

By the addition of the proper amount of low-fusing glaze powder, these stains can be made to mature at the desired temperature. The stains are mineral oxides incorporated with a powder similar to glaze powder. By the addition of low-fusing glaze

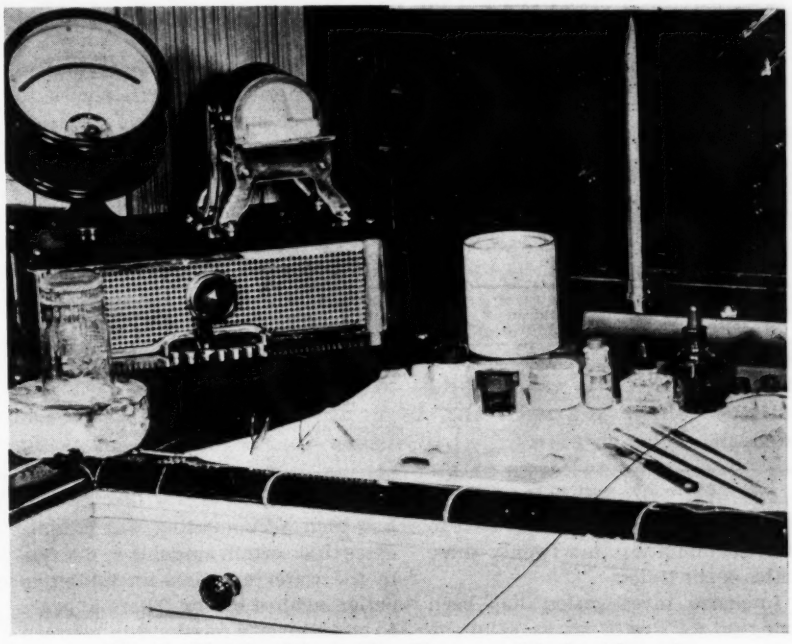


Fig. 22—Work bench for staining. Fluorescent light for night work.

powder, the fusing temperature or flow can be regulated. If the stain is to be blended and flowing is desired, glaze powder is mixed with the stain, but if no flowing is desired as in hair-line checks or stained margins, no glaze is added.

The powders, whether stain or glaze, are thoroughly spatulated with a medium of distilled water or a medium of glycerin and water of equal parts, or with Steele's super-stain medium. In dry climates, the use of distilled water is not practical because of its rapid evaporation. I prefer Steele's super-stain medium diluted about one-third with distilled water. An agate spatula is used because the powders may abrade a metal spatula, with detrimental contamination resulting. It is suggested that one minute be utilized in spatulation of each mix and that all the powder on the slab be incorporated in the mix.

Firing of Stains and Glazes—In firing diatoric teeth, it is preferable to mature the stain at approximately 1750 to 1800 degrees; but with gold clad pin teeth, the maturing temperature is from 1700 to 1725 degrees. In ceramics, there is the rule that temperature plus time controls the bake of the porcelain. Inasmuch as the same rule applies to stains and glazes, the temperature of each successive firing of stain or glaze should be slightly lower than the preceding firing. Overheating tends to fade the stains.

Some will say that 1700 degrees is too high a temperature for firing gold clad pin teeth. With the proper packing of the pins, no trouble need be experienced by the melting out of the solder or over-oxidizing of the pins. Fine asbestos can be packed in the space surrounding each pin; rouge and chloroform can be used; gold foil can be handpacked within the same space; or high heat crown and bridge investment can be used to cover the pins completely. These investments can be used to set all six anterior pin teeth and fired as one unit, the investment block serving as a protector of the pins and as a holder and tray at the same time.

If the pins are not completely covered with investment protection, they should be entirely submerged in extra-fine silex while within the furnace.

For convenience and safety of pins, some manufacturers are supplying, at little additional cost, platinum pin teeth made especially for staining and glazing. In my estimation the ideal tooth for staining and glazing should have a soldered-in, high-fusing pin, soldered in at approximately 2100 to 2200 degrees. This would make a stronger tooth and also prevent difficulty caused by checking around the baked-in platinum pins.

After all staining is completed, a final application of glaze is made, which serves as an added protection in polishing the dentures, as well as giving depth to the stain. Inasmuch as silicate porcelain restorations have a dull finish, glaze should not be applied over the surface of their reproductions.

Conclusion

We should not hesitate to reproduce reparative dentistry, such as silicate porcelain restorations, gold inlays, foils, or bridgework. Excellent results are obtained by pounding a gold foil in some natural location and then staining the margins to show defects.

Only as the defects and characteristics of an individual case are imitated can we expect to have a natural-appearing denture; and only as we develop skill and ability to imitate can we expect to create an esthetic denture.

Medical Arts Building.

Clinical Digest

DENTAL FLUOROSIS AND DENTAL CARIES

[American Journal of Public Health, 29: 1260 (November) 1939.]

FOR ALMOST ten years the presence of fluorine in water supplies has attracted attention as the cause of endemic dental fluorosis, or mottled enamel, which has been reported in 300 communities in twenty-three states of the Union.

Intensive investigation has been going on for five or six years in the National Institute of Health and in some western states with regard to mottled enamel and dental caries. Mottled enamel has been found to be due to the use of water carrying toxic amounts of fluorides during the period of dental calcification. Evidence has been accumulating which indicates that certain amounts of fluorine in the water exercises an inhibitive action against caries. There appears to be an inverse relationship between endemic dental fluorosis and caries.

Conclusions

1. Differences of water supplies must be considered the cause of differences in the dental conditions.
2. Partial control of dental caries may be possible through control of water supplies.
3. Chemical analyses of domestic waters should accompany all studies on caries.

Table of Incidences in North Central Illinois Study

Cities	Number of Children Examined	Number of Carious Permanent Teeth per Hundred Children	Proportion of Fluorides in Water Supplies	Percentage Free from Caries	Presence of Lactobacillus Acidophilus*: Counts of 30,000 or more
Macomb	112	401	0.2 parts per million fluorides	14%	No investigation made
Quincy	306	636	0.2 parts per million fluorides	14%	3.4 times as high as Galesburg
Galesburg	319	189	1.7 to 1.8 parts per million fluorides	35%	3.4 times as low as Quincy
Monmouth	148	205	1.7 to 1.8 parts per million fluorides	35%	No investigation made

*Believed by some to be a dependable index of the dental caries activity. In this case, finding may have been a coincidence.

The Editor's Page

FOR THE FIRST time, many of the investigators in the field of dental caries have put their observations and opinions together between the covers of one book.[1] This book bears the unusual and laudable inscription that "It is an 'open book'—for unrestricted use in the advancement of research, and for the promotion of knowledge and efficiency in oral health-service." This book represents the points of view of 195 investigators and observers in twenty-five countries of the world. Such an undertaking by the Research Commission of the American Dental Association certainly must be received with widespread enthusiasm. Although there has emerged from this project no conclusions of finality, no unanimity of opinion among the investigators concerning the etiology of dental caries, the publication is commended for the breadth of its endeavor. There can be gleaned from this book no hope that the cause of tooth decay is any closer to solution, but the avenues for future inquiry that have been opened by this study are many and challenging.

Until something definite in the way of etiology is proved and demonstrated, we must continue to accept the practice of the early recognition and early correction of the caries lesion as the most genuinely preventive procedure that we have at our command. To vitalize the philosophy of early recognition requires both educational effort and programs for the simple operative corrections for all school children.

Because dental caries is not a dramatic disease or life endangering, it is frequently viewed by parents and health administrators, for that matter, in an extremely casual manner. The dental profession itself is partly responsible for that indifference in not pointing out often enough and vigorously enough to the public that dental caries is truly a disease—"the most prevalent of all diseases." A practical program for early recognition and early care of the carious lesion would, of course, be built around the elementary school system. We cannot leave to chance or to the condition of the family pocketbook the correction of the lesion. All children should have the services of dentists for simple operative procedures made available to them. We should concentrate on the health and the maintenance of the first permanent molar. We should recognize that the flow of children through the school system is a continuous one and that the programs for dental care should be as permanent in the school system as courses in arithmetic and grammar. Sporadic and occasional efforts on the part of dental societies to interest school administrators are not enough. Gratuitous services for needy children are not the answer.

Programs in the schools should be maintained from tax funds. Programs in the beginning should not be too ambitious. Far better is it to start with a small group of children and do the job well than to start with a plan too wide in its scope and have it fail. It would probably be economically prohibitive for any school system to attempt a corrective program for all the school children in the elementary grades. It should not be prohibitive, however, to start in a given year a progressive project[2] for the children in the first grade—"the six-year molar people." The next year the new first grade children would again be concentrated on and the increments in dental defects would be taken care of in the second grade children. The third year, again, would emphasize the first grade children with correction of defects in the second and third grade children. Such an expanding dental program in any school system would give an opportunity to demonstrate its value and would give an eight-year period in which to develop the proper sentiment and support in the community.

The publication of the Research Commission of the American Dental Association on Dental Caries should be a source of stimulating interest and support in circles outside the dental field, notably among workers in the biologic sciences and among health administrators. This significant hope is well expressed in the preface to the book on DENTAL CARIES:

"It is hoped that philanthropic and public funds will soon be available for newly coordinated and more extended study of the urgent problems brought to view by this compilation. Prevention of 'the most prevalent of all diseases' assuredly deserves special attention from all who aim to conserve the public health and who seek to provide protection against the economic consequences of illness and disability."

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[1] Dental Caries: Findings and Conclusions on Its Causes and Control, Compiled for the Research Commission of The American Dental Association, By The Advisory Committee on Research in Dental Caries, New York, 1939.

[2] Studies on Dental Caries: Dental Status and Dental Needs of Elementary School Children, Reprint No. 1932, United States Public Health Service, Washington, 1938.

A Restoration for Maxillary Incisors

W. WARD TRACY, D.D.S., New York

IT IS DIFFICULT to restore the incisal angle of an upper central but there are numerous methods by which this may be accomplished. I feel indebted to H. S. Both for showing me the one I am about to describe, namely, the gold inlay with a porcelain hanger which has proved to be both durable and pleasing to the eye and may be used in a surprising number of instances.

Technique

1. After excavating the cavity, it is filled with cement.

2. The first step in the preparation is to slice away approximately one third of the tooth with a Joe Dandy disk, leaving a shoulder at the gingival as for a porcelain jacket crown. The lateral and incisal cuts are made as shown in Fig. 1.

3. Retention for the gold inlay is obtained in three ways: (1) by a gingival trench between the shoulder and the pulpal wall; (2) an incisal post hole which should be located with care to avoid too close proximity to the pulp; and (3) the inclination of the inciso-pulpal floor, all three of which tend to prevent lateral displacement.

4. All margins should be beveled except the labial and gingival which receive the porcelain portion of the restoration.

5. The impression and bite are taken.

6. The gold inlay, as shown in Fig. 5, is cast and set.

In making a porcelain jacket crown strength depends more on an even thickness of porcelain than on bulk. This rule is applicable in this instance as the porcelain hanger used is nothing more than a section of a porce-

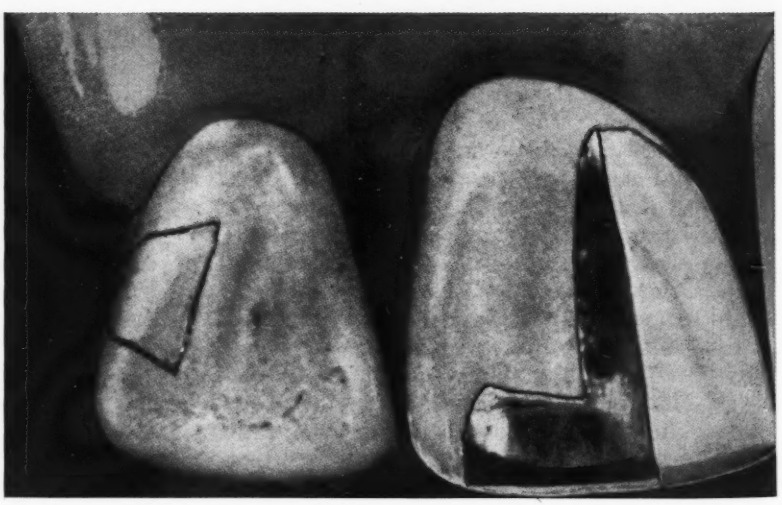


Fig. 1 (top)—Completed preparation; also completed preparation for a proximal porcelain inlay.

Fig. 2 (center)—Lingual view of gold inlay in place.

Fig. 3 (bottom)—Lingual view of gold inlay and porcelain hanger in place; also porcelain inlay in place.

Fig. 4—Labial view of finished restoration.

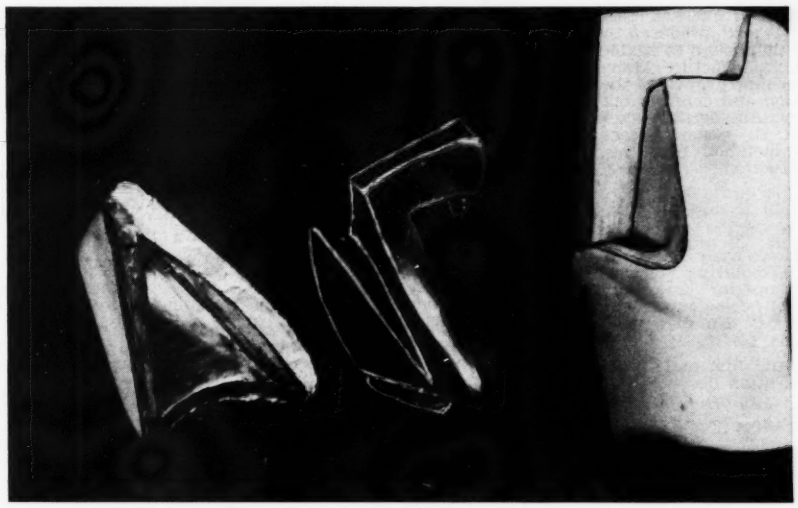


Fig. 5—Preparation: inlay and hanger.

lain jacket crown retained by the gold inlay spur.

7. A new impression and bite are taken of the tooth and the gold inlay.

8. The porcelain hanger is then made and cemented into place.

The preparation and construction of this restoration are not difficult once a thorough understanding of the principles are mastered.

9 *Rockefeller Plaza.*

NOTES ON THE *Cuff*

A Tragic Benefactor . . .

Ninety-five years ago this month a young man of 29 discovered the property of anesthesia by the inhalation of nitrous oxide gas. By this discovery was removed from the world the pains of childbirth and of surgery. Four years after his discovery, on his thirty-third birthday, Horace Wells died by his own hand. It is hard to reconcile the courageous scientist with the man who threw acid on the Broadway harlots. It is a poignant story, that of one of the greatest benefactors to mankind who, deranged by repeated inhalations of chloroform, ended his own life in the sordidness of the Tombs Prison in New York. Certainly in Wells as in most of us the potentialities for evil were as strong as the potentialities for good. In him, they achieved expression at each extreme. It is splendid that the world chooses to remember Horace Wells as the discoverer of anesthesia, not as the accoster of harlots.

Semantics in Reverse . . .

We all like occasional flights into the metaphysical and the esoteric but when an article in a dental publication makes one doubt his perception, when it is no clearer to the understanding after three readings, I think it is fair to put the name to it—not profundity but obfuscation. I would be eternally indebted for an explanation of the following:

"The relation of evaluational dis-

(*Continued on page* 466)

Outline of Dental Caries Study*

DENTAL CARIES: Findings and conclusions on Its Causes and Control, New York, 1939. Stated in 195 summaries by observers and investigators in twenty-five countries. Compiled for the Research Commission of the American Dental Association by The Advisory Committee on Research in Dental Caries: Daniel F. Lynch, Chairman; Charles F. Kettering, Counselor; William J. Gies, Secretary.

I. INTRODUCTION

A general analysis is made of the observations and conclusions as an outline aid to future investigators in preparing their own summaries from special points of view based on the data presented here.

II. GENERAL NATURE AND CONDITION OF CARIES

A. Definition

"Caries is a bacterial disease of the calcified dental tissues, producing typical lesions that originate in characteristic locations. The active etiological factor is acid, produced by bacteria on restricted areas often or long enough to enable the acid there to disintegrate the mineral structure. Many contributing or secondary factors determine growth of the organisms, and also affect concentration and confinement of the acid and the resistance to attack. Among these factors are (a) diet as it affects oral flora; (b) systemic reaction of the patient, including particular metabolic processes, oral secretions, and (c) tooth construction."—*Harold J. Noyes.*

B. Points of Agreement

1. " . . . A balanced (adequate) diet, (from early childhood (following normal prenatal nutrition) requiring vigorous mastication, favors development of superior jaws, well formed arches, excellent dentition, physiological tooth-cleansing, and low incidence of caries." No dissenting opinion.

2. "Incidence and progress of caries, and film and tartar formation increase as degree of mastication decreases."—*Haber.*

3. Race mixture has not been shown to affect predisposition to caries.—*Krogman* and *Rabkin.*

4. Incidence of caries is least in primitive, greatest in civilized persons.—*Ahmed, Hearman, Krogman, Hatton, Price.*

5. General health is not necessarily an index of dental status.—*Walker.*

C. Points of Disagreement

1. Relation between caries and growth is noted.—*Bunting, Hurme, Jones, Morse, Toverud.*

2. Regional differences are indicated.—*Pedersen, Taylor, Agnew, King, Kirkpatrick, Klein, Krikos, Mack, Meyer, Mills, Ortion.*

3. Seasonal fluctuations in the occurrence of caries have been observed.—*Becks, McBeath, Mills.*

4. It is believed by some that the teeth of women are more susceptible than men.—*Hollander, Karlström, Klein, Knutson, Morse* records opposite observations. *Bunting* finds no difference.

5. Direct decalcification by acid-containing candies or medicines are regarded as an active preparatory factor in caries.—*Gunn, Miller, Tanchester, West.*

III. CARIES IN PRIMITIVE PEOPLES

A. Agreement (General)

Refined foods and civilized methods of preparation when applied to primitives increases incidence of caries.

B. Dissenting View

There was more caries present among primitive people than is generally believed.—*Krogman.*

C. Lack of Agreement

As to how the introduction of refined foods brings about an increased incidence of caries.

D. Problems for Further Study Suggested:

1. Does civilization and its refined foods cause:

"a) deterioration in the quality (structure) of teeth, owing to dietary deficiency, nutritional anomaly, or systemic disturbance; or

b) impairment of the protective qualities of oral secretions; or

c) reduction in the vigorous mastication that primitive diets require, and in the ensuing physiological cleansing (and protective attrition) of the teeth; or

d) periodic retention, on lodgment (stagnation) areas on teeth, of food particles (unlike those from primitive diets) that favor predominance of acidogenic bacteria over other types of oral organisms; or

e) all these and other conditions?"

2. Should primitive diets be substituted for civilized diets to attain prevention? (Cf. *Hatton* and *Price.*)

IV. EXCITING (DIRECT, ATTACKING) CAUSES OF CARIES

A. Most authorities regard external attacking factors as preponderant influences.

B. Miller's Theory:

"Caries results at a particular locus on a tooth (configuration, position, arrangement, lamellae, defects), from direct action there of forces *external* to the affected tooth:

a) repeated stagnation of fermentable matter;

b) recurrent production (by bacteria, enzymes) of 'fermentation acids' in concentrations sufficient to disintegrate mineral-enamel components;

c) decalcification continuing until enamel is broken at locus and dentin subjected to further action of bacteria;

d) the affected dentin then being progressively disintegrated with attendant decomposition (putrefaction) of the organic (protein) structure in the path of the bacterial invasion, which tends to penetrate protective secondary dentin and to advance to and enter the pulp."

V. LOCAL CONDITION IN CARIES

A. Saliva

1. Special constituents of saliva that stimulate or inhibit growth of oral bacteria are indicated.—*Hill, H. Leonard, Weinmann.*

2. Many emphasize alkalinity or buffer action of saliva as an important factor in protective neutralization (reduction) of acidity (pH) on dental areas, arising from bacterial action.

3. No author has indicated how effective salivary protection against caries on areas most in need of it might be induced.

4. Stated correlations of salivary constituents, such as ammonia (*Grove*), with resistance or susceptibility to caries are considered unwarranted.—*Bunting, Karshan, Scrivener, Youngburg.*

B. Oral Bacteria

1. Agreement (General)

Caries is initiated by oral acidogenic bacteria. *L. acidophilus* is the attacking organism. Proteolytic bacteria destroy organic matter in path of carious invasion.

2. Dissenting Views

a) Bacterial initiation of caries is not recognized by *Bregstein, Broderick, Mellanby.*

b) Bacteria are present in carious lesions only incidentally.—*Briggs, Proell.*

c) Micoörganisms other than or in addition to *L. acidophilus* have been found.—*Belding, Berke, Bibby, Fosdick, Hearman, Hine, Lyons, Okumura, Westin.*

3. Differences in bacteriology of mouths of persons and animals illustrated by *Koszeg, Fish.*

4. Problem for further research: Can resistance to caries be improved or immunity established, by increasing, by dietary or medicinal means . . . the anti-bacterial power of saliva?—*Gottlieb.*

5. Methods of determining resistance or susceptibility to caries, by estimations of the number or activity of oral bacteria have been indicated by *Blayney, Bunting, Fosdick, Hansen, Hatton, Wach.*

C. Enamel

1. Not a vital tissue after its formation.

a) Dissenting view: Enamel has vitality.—*Bödecker, Bregstein, Karlström.*
b) Prevailing conclusion: "The way in which minute structure may influence liability to caries has not been explained. How can a tooth, however well formed, resist an attack which is apparently primarily chemical; what is there in the teeth which can prevent acid from dissolving the enamel of those teeth with which it remains in contact? Is it conceivable that, as fast as the enamel is decalcified, the vitality or 'resistance' of the tooth effects a recalcification?"—*Weaver.*

c) "Enamel cuticle protects enamel from food acids in transit through the mouth, but does not prevent acid (formed by bacteria) in prolonged contact with it from initiating caries."—*Wallace.*

2. Remineralization

a) Remineralization is believed possible.—*Bisnoff, Boyd, Gore, Gysi, Koszeg, Kraus.*

b) Dissenting opinion: *Applebaum, Belding, Weaver.*

c) Mottled enamel: Despite its imperfect calcification structure) is not more, and may be less, liable to caries than normal enamel.—*Applebaum, Atkins, Dean, McKay, Piperno.*

D. Tooth resistance to caries

1. Predisposition to caries is largely controlled by original structure (composition, density, hardness) of teeth.—*Mellanby.*

2. Disagreement on relationship of enamel hypoplasia to incidence of caries.

3. Regard activity of pulp (regulating flow of lymph) as a protective factor.—*Blackberg* and *Bödecker.*

a) *Fish* and others dissent.

b) *Kanner* has recently found that enamel does not contain lymph.

VI. SYSTEMIC CONDITIONS IN CARIES

A. Agreement (General)
"Most authors believe that in caries systemic conditions or influences after the formation of a tooth are, as affecting that tooth, subordinate to local (attacking) forces; the opposite view, that systemic factors are more influential than local conditions and may overcome the latter, is indicated by many."

B. Blood Relationships

1. Immunological factors have been noted.—*Bunting, Macphee, Proell, Ross Scrivener.*

2. Correlations between common blood constituents and conditions and susceptibility to caries have not been established.—*Bunting, Chiavaro, Karshan, Krogman, Neuwirth, Rosebury, Wach.*

3. Disturbances in the calcium/phosphorus or acid/base balance in the blood believed to be influential factors in susceptibility to caries.—*Broderick, Jones, Page.*

4. Caries is due to preponderance of dehydrated over hydrated colloidal particles in the blood of the person affected. —*Broderick.*

C. Endocrine Glands
"Endocrine glands (internal secretions, hormones) are occasionally mentioned as influences but these references are 'notably general, often indefinite, and frequently based on assumptions that conditions that modify bones also affect teeth.' "

D. Heredity: Fundamental influence in resistance or susceptibility to caries.
Dissenting Views: *Atkins, Korkhaus, Krogman Read.*

E. Nutrition

1. Diet in general

a) Importance of dietary essentials and assimilation is emphasized.

b) Operation of nutritional factors on fully formed enamel has received little attention.

c) Opinions divided as to whether caries is due to dietary deficiency of any nutritional essential.

d) Prevailing judgment: "A balanced diet—containing optimal amounts of all essentials for the production of perfect teeth—does not assure immunity from caries if local (oral) conditions are favorable for the multiplication and destructive action, on dental areas, of acidogenic oral-bacteria."

e) "A correlation between calcium metabolism and caries has not been established."—*Schour.*

f) Most recorded observations on the influence of diet on resistance to caries are not comparable, because they are not based on similar conditions and controls.

2. Refined Foods

Lack essentials for tooth formation and salivary secretion and thus for tooth defense against fermentative decalcification. *Osborn* found that in the refining process a protective agent is removed.

3. Sugars

a) Generally regarded as conducive to initiation of caries.

b) Detrimental influence of sugar is indirect, by displacing essentials in diet.—*Mellanby, Boyd, Brodsky, Hawkins, Lennox, Philpots, Price.*

c) "An unsweetened tooth cannot decay."—*Waugh.*

F. Pregnancy

1. Predisposes to caries.—*Enright, Hardgrove, Jones, Lennox, Proell, Toverud.*

2. Dissenting opinions: *Chiavaro, Gompertz, Husband, Klein, Morris, Wannenmacher, Ziskin.*
"Pregnancy *per se* does not cause caries . . . a review of the literature does not support the belief that calcium is withdrawn from teeth, as from bone, during pregnancy."—*Ziskin.*

VII. ADDITIONAL STATED CAUSES OF CARIES

Varied and numerous individual opinions, among them

A. Consumption of refined cereals causing predominance of streptococci.—*Belding.*

B. Orthodontic appliances when precautions are not taken. —*Breitner.*

C. Psychic trauma.—*Briggs.*

D. Constitutional vegetative imbalance.—*Broderick.*

E. Salt used as seasoning.—*Mills.*

F. Excessive frequency in eating, not giving time for cleansing.—*Morris.*

VIII. PREVENTION (ARREST, CONTROL) OF CARIES

A. Caries cannot be prevented through removal of its causes as the causes have not been established.

B. Retardation of progress of caries can be accomplished:

1. Diet (*Krikos*)

2. Prophylactic odontotomy (*Hyatt*)

3. Treatments with Howe's ammoniacal silver-nitrate solution and reduction with eugenol four times a year, on surfaces where the enamel surface continuity remained (*Prime*)

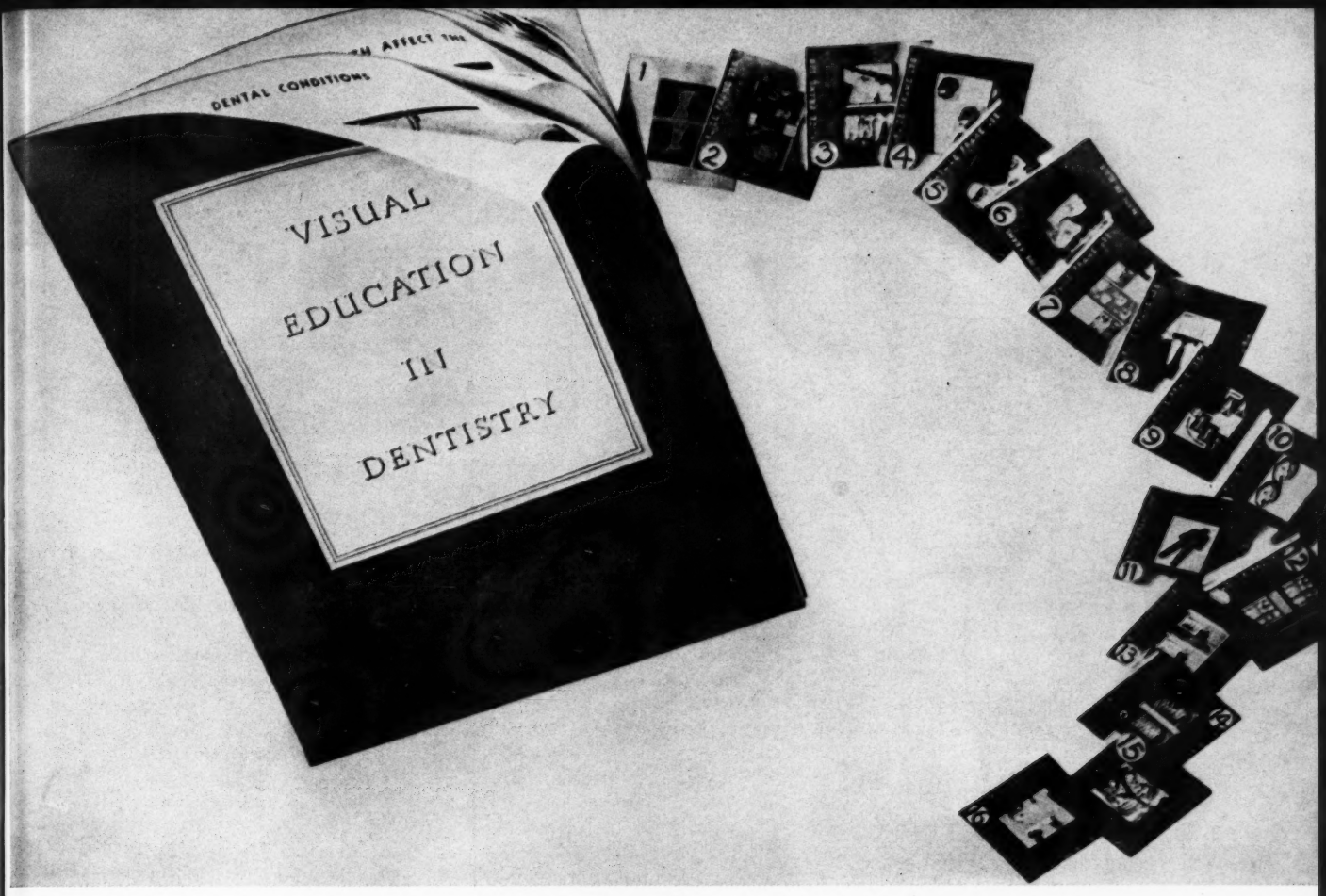
4. Coordinated hygienic procedures (*Belding, Chiavaro, Greth, McCall*) Modifying dissenting opinion: *Brekhus; Brodsky; Churchill; Cotton; Enright.*

C. "The best possible practical dentistry for all in need of it will be the dental profession's continued purpose in private and public health service."

*All interpretive comments, not directly quoted from authors are deductions of the Research Commission of The American Dental Association, and are not those of the editors of THE DENTAL DIGEST.

ANNUAL INDEX
1939

VOLUME 45 — NUMBERS 1 THROUGH 12



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13. "Things Are Not Always What They Seem . . . "
14. Why Construct a Bridge?
15. Dental Conditions
16. "A Little Neglect May Breed Mischief . . . "

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NOTES ON THE CUFF

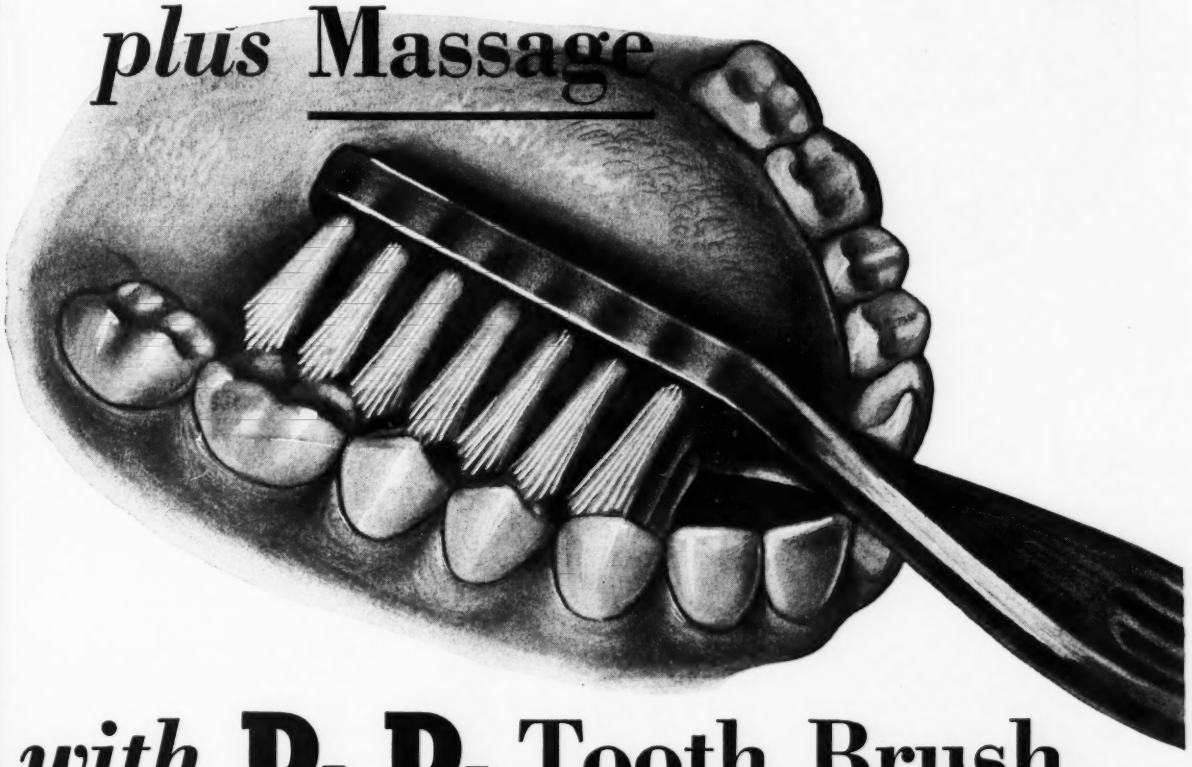
(*Continued from page* 461)

orders and caries appears to be an invariant one as deduced from my observation of approximately 10,000 mouths since 1924. This may be exhibited by example in the mouths of many Vermont farmers' wives, for instance.

"Evaluational disorders are based upon 'false-knowledge' well impressed thalamically from birth and incorporated in traditions and doctrines until the assumptions become established. The salt-pork and potato barrel of Vermont, as well as semantic injuries from political cruelties, etc., in the environment, can cause serious neuro-endocrine disturbances of the organism."

Believe it or not, this is from an article in the *Journal of the American Dental Association* of November, 1939, page 1819, which is supposed to have something to do with dental caries. This article purports to apply the

Almost 100% Tooth Surface Coverage *plus* Massage



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science of semantics which is the study of exact meanings of words. Mr. Stuart Chase, the most popular commentator on semantics, points out that words can be tyrannical weapons if improperly used and that words should express correct and careful referents and precise meanings. The author of the article in the *Journal of the American Dental Association* exemplifies the quotation:

"Each man kills the thing he loves;
Some do it with a sword,
Others with a word . . ."

Anthropologists Laugh Lest They'll Cry . . .

Anthropologists like Hooton of Harvard are the least ponderous of scientists. Maybe it is because they know how old the earth is and how young man is in the order of creation that they can't get very excited about any of the foibles of the moment. Wilton Marion Krogman of the University of Chicago, in addressing a dental group, defined the science of anthropology as the "science of man—embracing women." And evolution from the school boy's point of view is something like this: "Man and woman both come from apes. Woman came first and man has been after her ever since." "If the age of the earth," said Krogman, "is represented as the distance from Chicago to Salt Lake City, the time of man on the earth is represented as one step of about 3 feet."

Epigrams . . .

Percy B. D. Idler, speaking on the conduct of the dental practice:

"Overhead has no gratuitous moments. . . .

"The dental office should be an oasis of clean, neat, harmonious dignity. . . .

"The dentist should be an authority on dental science and art, not the isms of the day. . . .

"The dentist cannot exalt himself on the failure of other dentists. . . .

"If you don't respect your profession, leave it. . . ."

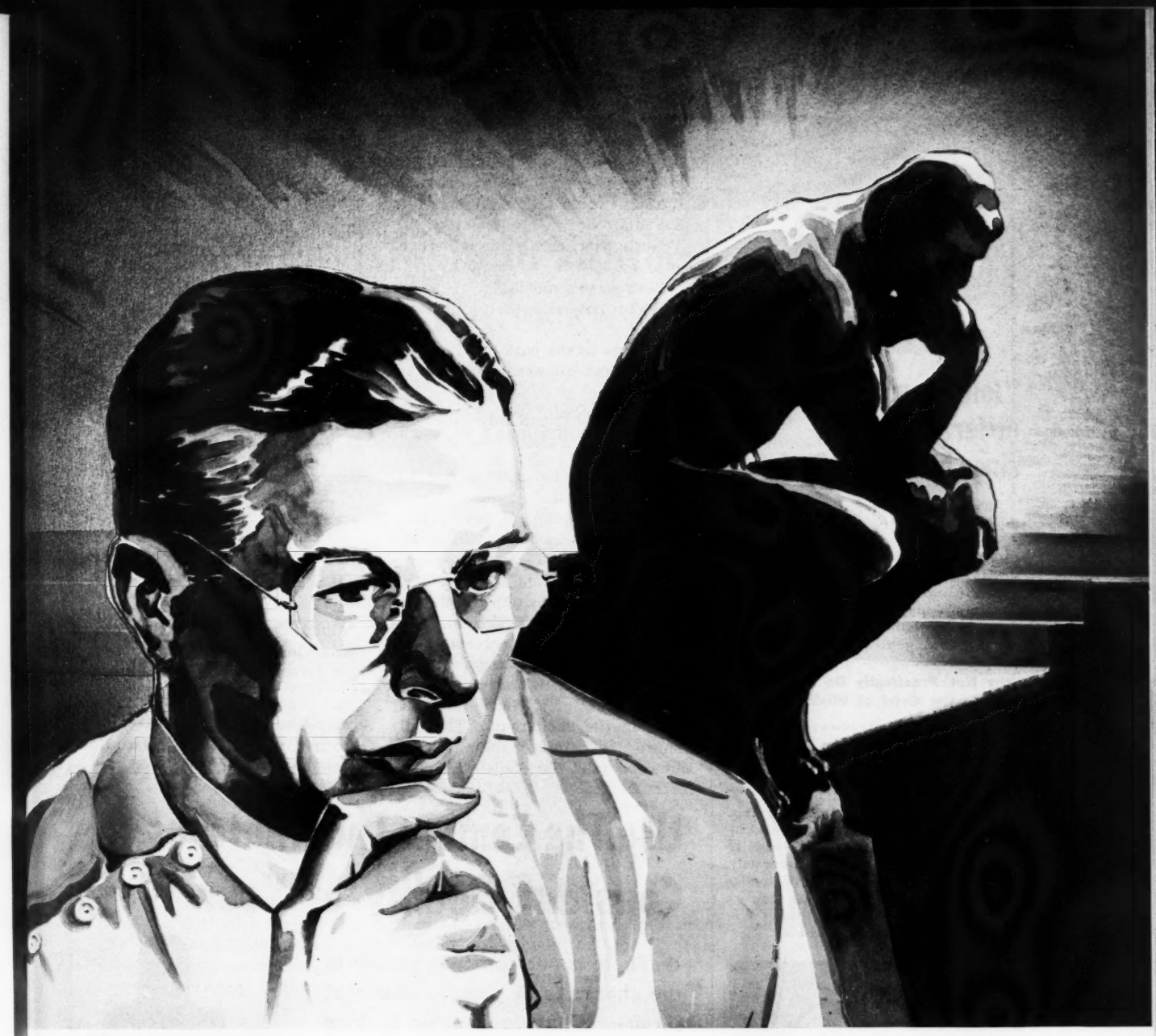
One More Epigram . . .

A lawyer and physician are about to debate on socialized medicine. The woman who introduces them remarks concerning their subject:

"Where privilege lives, two brats, smugness and indifference, move in."

Christmas Carol—1939 . . .

Recently a foreign correspondent



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told about a conversation he had overheard between two little boys, about 6 years of age, who were sitting on a curbstone in a city across the Atlantic. Their talk ran something like this:

"Gosh, what can we do if we can't go to school?"

"Let's go to a movie."

"We're not allowed to go to a movie."

"Let's go to the park."

"We're not allowed to play in the park."

"Let's play ball."

"The other kids aren't allowed to play with us."

"Well, we can't sit here all day, the cops will chase us."

The second scene is a metropolitan street in America. It is twilight. The traffic rants its rush-hour impatience. Children are making the most of it before their call to dinners of well-balanced nutrition. Each man is for himself, boarding busses and street cars, free to do so as best he can. The races commingle without restraints. The churches of all faiths lift their spires in the background. The only bonfires burn the last rakings before the snow falls. Two lads of about 4 and 5 stand on the street corner, singing slightly out of tune but zestfully: "God Bless America."—E. J. R.

DENTAL MEETING Dates

Greater Philadelphia Society, annual meeting, Benjamin Franklin Hotel, Philadelphia, January 30-February 2, 1940.

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Chicago Dental Society, midwinter meeting, Stevens Hotel, Chicago, February 12-15, 1940.

•

Alpha Omega Fraternity, annual convention, Essex House, Newark, New Jersey, December 30-January 1.

•

Five-State Post Graduate Clinic, eighth annual meeting, Willard Hotel, Washington, D. C., May 19-23.

Here is the lineup of patient education material available to subscribers to THE DENTAL DIGEST . . . .

1. VISUAL EDUCATION IN DENTISTRY. Virtually all subscribers to *The Dental Digest* are acquainted with this book of charts. More than 40,000 copies have been sold and the charts are being used advantageously in daily practice. If you do not have a copy we suggest you order now as you'll find the various charts helpful. Practitioners everywhere refer to the charts as the most practical practice builders available at the present time. If you have a dogeared copy we suggest you order a fresh copy now. Price—to regular subscribers—$1.00 per copy.

2. THE CASTLE THAT WAS DESTROYED. This feature chart appeared in the May, 1939, issue of *The Dental Digest.* Beautifully printed reprints, in two colors, are now available. This is material that gives dentists something to use in showing children the value of dental conservation. You can create timely goodwill by giving reprints to your child patients. Prices in quantity lots are as follows: 12—$1.00; 25—$2.00; 100—$6.50; 200—$10.00.

3. TOOTHBRUSHING ROUTINE. A fine reprint for patient distribution. It illustrates in complete detail a toothbrushing routine that is acknowledged as being effective. Patients will appreciate this graphic presentation of a tremendously important subject. Prices—100—$6.50; 200—$10.00; additional 100's —$3.00.

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For the convenience of our subscribers we attached a postage paid envelope in the July issue. Use it when ordering any of the patient education material that you need at this time in your practice. You'll find the material a good investment. You may remit direct with order—or have the charge go through your dealer.

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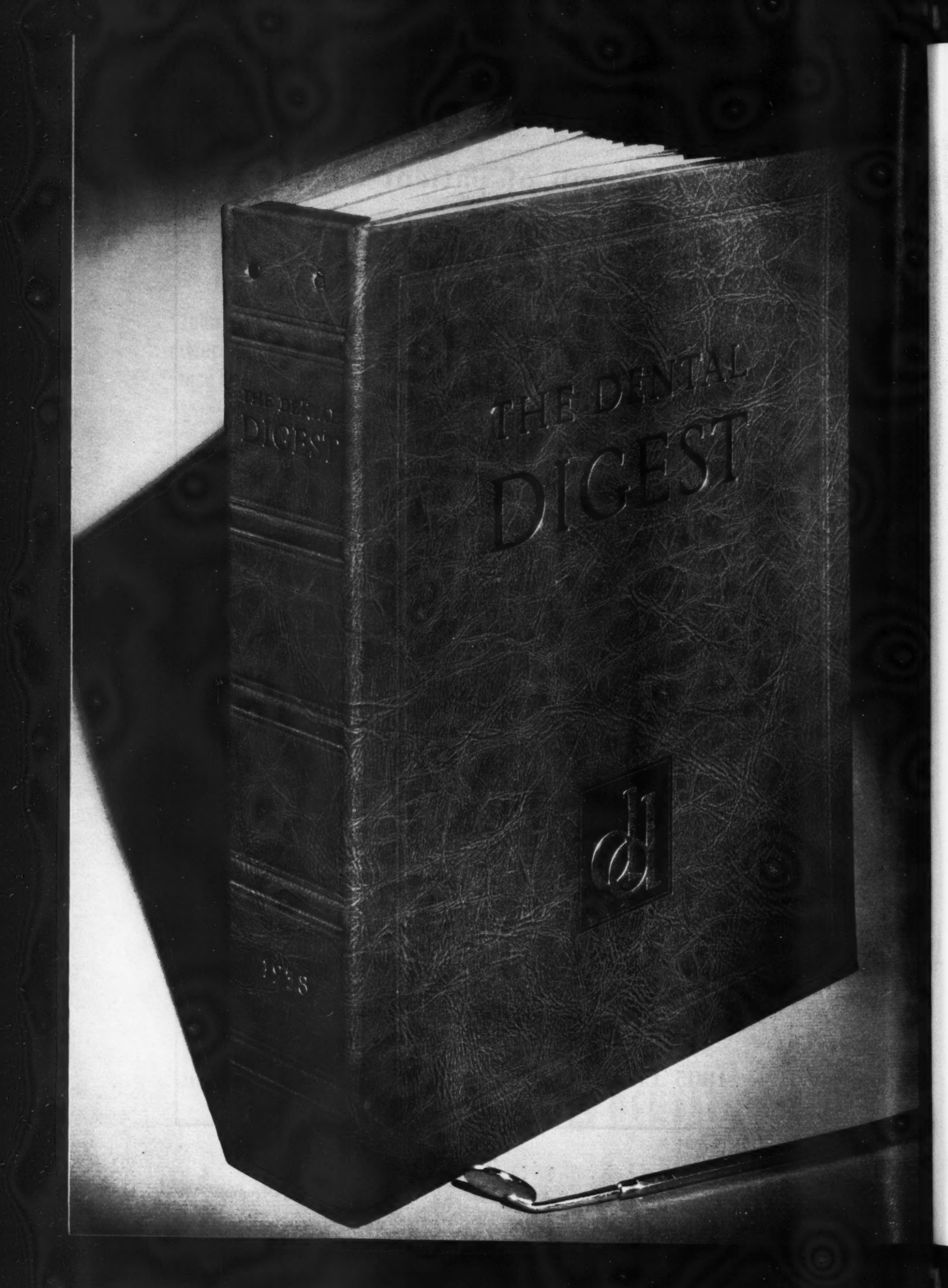
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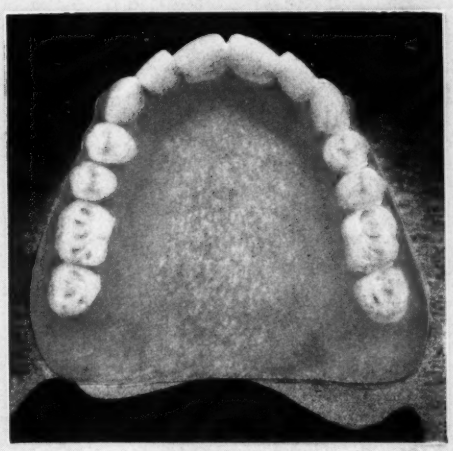

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